

least plastic beverage bottles comprising the steps of:

commminuting said plastic beverage bottles to form a mixture of particles containing PET flakes; and

washing the PET flakes, said washing comprising simultaneously treating the PET flakes hydraulically and mechanically in at least one washer with a cleaning solution including caustic soda at a temperature exceeding 70°C and for more than 20 minutes.

30. A method for recycling according to claim 29, said step of treating the PET flakes comprising a treatment time in said washer of about 20 to 40 minutes and a treatment temperature of about 75 to 95°C.

31. A method for recycling according to claim 29, wherein the treatment time is about 30 minutes.

32. A method for recycling according to claim 29, wherein the treatment temperature is about 80 to 90°C.

33. A method for recycling according to claim 29, said step of washing further comprising mechanical stirring and high pressure hydraulic spraying in said washer.

34. A method for recycling according to claim 29, further comprising using filtration in said washer.

35. A method for recycling according to claim 34, further comprising using sieving in said washer.

36. A method for recycling according to claim 29, further comprising using sieving in said washer.

37. A method for recycling according to claim 29, further comprising using filtration following said washer.

38. A method for recycling according to claim 37, further comprising using sieving

following said washer.

39. A method for recycling according to claim 29, further comprising using sieving following said washer.

40. A method for recycling according to claim 29, and adding at least one additive to the cleaning solution.

41. A method for recycling according to claim 29, further comprising the step of treating the PET flakes in at least one sink-float separator in the cleaning solution including caustic soda, wherein said treating is subsequent to said washing.

42. A method for recycling according to claim 41, further comprising the step of intensively washing the PET flakes in at least one intensive washer in the cleaning solution including caustic soda, wherein said intensively washing is subsequent to said treating in said sink-float separator.

43. A method for recycling according to claim 41, further comprising the step of recirculating the PET flakes through said sink-float separator for said treating and subsequently through said intensive washer for said intensively washing.

44. A method for recycling according to claim 41, further comprising the step of partially recirculating the PET flakes through said sink-float separator for said treating and subsequently through said intensive washer for said intensively washing.

45. A method for recycling according to claim 41, further comprising the step of separating said cleaning solution including caustic soda from the PET flakes subsequent to said intensively washing, and recycling said cleaning solution including caustic soda.

46. A method for recycling according to claim 29, further comprising the steps of continuously monitoring the concentration of said cleaning solution including caustic soda, and adjusting said concentration by measured additions to said cleaning solution including

caustic soda.

47. A method for recycling according to claim 29, wherein said washer is heated.

48. A system for recycling PET flakes from plastic beverage bottles having been comminuted to form a mixture of particles comprising:

a treatment section adapted to treating said mixture including at least one washer and at least one sink-float separator, wherein said washer comprises:

a stirrer;

mechanical and hydraulic treatment devices adapted to treating the PET flakes.

49. A system for recycling in accordance with claim 48, said treatment section further comprising sieve plates and automatic filters in said washer.

50. A system for recycling in accordance with claim 49, wherein said hydraulic treatment devices of said washer further comprise nozzle pipes being connected to at least one pump.

51. A system for recycling in accordance with claim 50, said stirrer having a plurality of stirrer stages, wherein said sieve plates, said filters and said nozzle pipes are fixedly disposed in relation to said plurality of stirrer stages.

52. A system for recycling in accordance with claim 50, wherein said pump is a high pressure pump.

53. A system for recycling in accordance with claim 48, said treatment section further comprising sieve plates and automatic filters subsequent said washer.

54. A system for recycling in accordance with claim 53, wherein said hydraulic treatment devices of said washer further comprise a plurality of nozzle pipes being connected to at least one pump.

55. A system for recycling in accordance with claim 54, said stirrer having a plurality

of stirrer stages, wherein said sieve plates, said filters and said nozzle pipes are fixedly disposed in relation to said plurality of stirrer stages.

56. A system for recycling in accordance with claim 54, wherein said pump is a high pressure pump.

57. A system for recycling in accordance with claim 48, wherein said heating device comprises at least one heat exchanger.

58. A system for recycling in accordance with claim 57, wherein said heating device further comprises at least one direct heater.

59. A system for recycling in accordance with claim 48, wherein said heating device comprises at least one direct heater.

60. A system for recycling in accordance with claim 48, wherein said heating device comprises electro-pneumatic control for maintaining a treatment temperature in said washer in the range of about 70 to 95°C.

61. A system for recycling in accordance with claim 60, wherein said treatment temperature is in the range of 80 to 90°C.

62. A system for recycling in accordance with claim 48, wherein said sink-float separator is coupled to said washer and operated with said cleaning solution including caustic soda being at an elevated temperature.

63. A system for recycling in accordance with claim 48, further comprising at least one intensive washer disposed downstream of said sink-float separator.

64. A system for recycling in accordance with claim 63, further comprising a bypass between said sink-float separator and said intensive washer, wherein said bypass provides a hold-up circuit simultaneously in said sink-float separator and in said intensive washer.

65. A system for recycling in accordance with claim 63, further comprising a

separator for said cleaning solution including caustic soda, wherein said separator is disposed downstream of said intensive washer.

66. A system for recycling in accordance with claim 65, further comprising a neutralizer disposed downstream of said separator, wherein said neutralizer is connected to a fresh water supply and to an acid measuring station.

67. A system for recycling in accordance with claim 65, further comprising a neutralizer disposed downstream of said separator, wherein said neutralizer is connected to a fresh water supply and to a CO₂ measuring station.

68. A system for recycling in accordance with claim 48, said feeder device comprising a supply branch provided at least from said separator to said washer.

69. A system for recycling in accordance with claim 68, wherein said supply branch comprises a supply pump.

70. A system for recycling in accordance with claim 68, said feeder device further comprising a measuring and metering unit connected at least to said supply branch.

71. A system for recycling in accordance with claim 70, wherein said feeder device is also connected to said sink-float separator.

72. A system for recycling in accordance with claim 70, said measuring and metering unit having a pre-heater device.

73. A system for recycling in accordance with claim 48, wherein said sink-float separator is connected to a fresh water supply.

74. A system for recycling in accordance with claim 48, further comprising a heavy material separator disposed upstream of said washer.

75. A system for recycling in accordance with claim 48, further comprising a metal separator disposed downstream of said washer.